REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested.

The rejection of claims 2-7, 13-16 and 20-23 under 35 U.S.C. §103 as allegedly being made "obvious" based on Elliot '504, Billhartz '587, Light '866 and Baran '433 is respectfully traversed.

The Examiner has now cited three new combinations of references to assert obviousness. However, despite the Examiner having combined no less than four references (five for dependent claim 8), there are still features of the claims that are not disclosed or suggested by these notional combinations.

There must also be a question as to whether it is justifiable to combine as many references as this, and also whether all the references truly come from the same field of art.

Elliot and Light are concerned with self-organizing communication networks for collecting data from mobile sensors.

Billhartz and Baran are also self-organizing networks, but do not have the data collection function.

To paraphrase claims 20 and 22, the claimed invention requires a status value to be derived for each device, based on parameters including the amount of data waiting to be transmitted and the distance from other such devices.

Information relating to such status values is exchanged with neighboring devices. On the basis of the status values of the device and its neighbors, it then makes a decision as to whether to transmit the data it holds to such other devices.

The status values, therefore, determine the devices' respective capabilities to store and forward data, and thus comparison of two devices' status values can be used to determine which of the devices is more capable of doing so, allowing data to be transmitted to that device from the other one. Capability may be determined by such factors as proximity to neighbors, spare buffer capacity and battery life, as defined in claim 19. Thus, data will flow towards the devices more capable of holding it (and can not travel in circles as this would require at least one movement against the flow). Provided that at least one data collection point is present at which data is removed from the system rather than forwarded (acting as a data "sink"), all data will ultimately find its way there.

Elliot discloses a system of sensor nodes in which data travels from one sensor to another through an ad hoc network. Column 4 describes the organization of this network, but is silent as to how it is established in the first place other than by reference to another U.S. application Serial No. 09/999,353, which does not appear to be available on the USPTO database. It seems though that the nodes are allocated to "tiers". These "tiers" can not be considered directly analogous to the status values of applicants' claims, as they are not determined in the same way. From columns 7 and 8

of Elliot, it appears that when a device becomes active, it selects another (already-active) device as a "parent", and thus will be established in the tier below that parent.

Thus, the only determinant of the tiers to which two neighboring devices are allocated and, therefore, in which direction data will pass, is by which device has been active longer. In the applicants' claimed invention, the factors determining which devices should transmit data to which others depend on dynamic factors such as the amount of data currently in the buffer, which will vary with time depending on whether the devices are collecting data (either from the environment or from each other) faster or slower than they are passing it on to further devices.

Turning to Light, the Examiner cites paragraphs [0014] and [0016]. However, this reference describes a self-organizing system which simply determines the positions of each device by determining the distances between them and using triangulation (paragraph [0017]) to determine their positions. There is no suggestion of each device having a scalar value associated with it - only its position (which is a co-ordinate (vector) – and no hierarchy from which to determine the direction in data should flow between two of the devices.

Baran is not an ad hoc network. The nodes each have a unique geographical identifier (see 3:48-64). Each node uses knowledge of link quality to determine to which other nodes it should transmit packets. A hierarchy is mentioned (4:21), but it is apparent that this is not an absolute measure – it is an order of preference, specific to

one node, of the links to neighboring nodes. In particular, it should be noted that each node will establish a different hierarchy for its links to neighbors, depending on, among other things, its distance from those neighbors (see column 8). The nodes themselves have no status associated with them – the hierarchy relates to the links between nodes.

Billhartz is not concerned with data collection, but with applications in which two-way communication is required between any given pair of nodes in the network. The problem addressed is, therefore, rather different. In particular, the question of the direction of data flow is not pertinent – in Billhartz' system, information must be able to flow in both directions, and there is no ultimate destination ("sink") to which all data is to go. Paragraph [0049] mentions unilateral communication, but it is apparent that the process is the same as for bilateral communication.

Paragraph [0053] in Billhartz discusses the measurement of a quality (QoS) values both for links between nodes, and of the nodes themselves. However, as seen from paragraph [0051], the various QoS measures do not result in a status value, but a connection confirmation or denial (CONFQ or RERRQ) in response to a connection request RREQQ. Note, in particular, that this is a binary value (yes/no) and applies equally to communication in either direction.

The applicants' claimed invention only specifies how a first device determines whether it can transmit data to a second device – it does not specify whether the first device can receive data from the second device. However, in general, if data can not

be transmitted in one direction, it can be transmitted in the converse direction. This is not the case in Billhartz, where two-way communication is established (or not).

Note that in applicants' claims, the status of the device (not a particular link to that device) depends on its separation distance from other devices. This value is independent of which other device receives that data – the subject device may have nearer neighbors than the one requiring that data, which will be a factor determining how suitable it is to have data forwarded to it – if it has near neighbors, it needs less power to forward any data it receives on to those near neighbors.

Thus, none of the cited references has a status value associated with each device based on the amount of data stored and the distance from other devices. In those where a status value is derived from a measured quantity (Baran and Billhartz), it is the quality of individual links that are measured. In these references, the values are not a measure of the status of the device itself (it will, in general, have more than one link, each with a different value associated with it). Furthermore, link quality will be the same for the devices at each end of a link so there would be little point in communicating it from one to the other, or comparing it with a value received from another such device, and it could not be a determinant of which direction data should be passed over that link.

In the applicants' claimed invention, the devices themselves have status values, and comparison of these status values can be used to determine in which direction data

should pass between them on its way to its ultimate destination (the data collection point or "sink").

Given such fundamental deficiencies as already discussed with respect to the independent claims, it is not necessary at this time to discuss additional deficiencies of this allegedly "obvious" combination of references with respect to other aspects of the rejected claims. Suffice it to note that, as a matter of law, it is impossible to support even a *prima facie* case of "obviousness" unless the cited prior art teaches or suggests each and every feature of each and every claim.

The rejection of claim 8 under 35 U.S.C. §103 as allegedly being made "obvious" based on Elliot/Billhartz/Light/Baran in further view of Ivan is also respectfully traversed.

Fundamental deficiencies of the first four references have already been noted above with respect to parent claim 22. Ivan does not supply those deficiencies. Accordingly, it is not necessary at this time to discuss additional deficiencies of this allegedly "obvious" five-way combination of bits and pieces from numerous references – for reasons as a matter of law already noted above.

Similarly, the rejection of claims 9-11 and 17-19 under 35 U.S.C. §103 as allegedly being made "obvious" based on Elliot/Billhartz/Light/Baran in further view of Krishnamurthy '448 is also respectfully traversed.

Once again, the fifth cited reference does not supply deficiencies already noted of the earlier four references with respect to a parent claim. Accordingly, it is not necessary, as a matter of law, to discuss further deficiencies of this allegedly "obvious" combination of bits and pieces from five different disparate references with respect to the additional aspects added by these rejected claims.

Accordingly, this entire application is now believed to be in allowable condition, and a formal notice to that effect is earnestly solicited.

Respectfully submitted,

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